

Commercial Electric Utility Mercury Control Technology Bookings

Air pollution control vendors are reporting booking new contracts for mercury control equipment for more than two dozen power plant boilers. The contracts for commercial systems are attributed to federal and state regulations, including new source permit requirements and consent decrees, which specify high levels of mercury capture. Below is a summary of the mercury control equipment that has been procured to date. **Last Update: 04-21-08**

	Plant Size (MW)	Location	Prime OEM Contractor	Coal	APC Configuration	Hg Control	New Plant or Retrofit	Regulatory Driver	Anticipated Startup Date
1	90 MW ea. 270 Total	Midwest	Siemens Envir. Sys. (Norit/ADA-ES)	PRB	TOXECON	ACI	Retrofit	Consent Decree	1 st Qtr 2005
2	250	East	Siemens Envir. Sys.	Bituminous	SDA/FF	ACI	Retrofit	State Regulatory	2 nd Qtr 2008
3	250	East	Siemens Envir. Sys.	Bituminous	SDA/FF	ACI	Retrofit	State Regulatory	2 nd Qtr 2008
4	650	East	Siemens Envir. Sys.	Bituminous	ESP	ACI	Retrofit	State Regulatory	
5	740	Midwest	B&W (ADA-ES)	PRB	SDA/FF	ACI	New Plant	New Construction Permit	
6	550	Midwest	B&W (ADA-ES)	PRB	SDA/FF	ACI	New Plant	New Construction Permit	
7	350	West	B&W (ADA-ES)	PRB	SDA/FF	ACI	Retrofit	Consent Decree	
8	350	West	B&W (ADA-ES)	PRB	SDA/FF	ACI	Retrofit	Consent Decree	
9	800	West	B&W (ADA-ES)	PRB	SDA/FF	ACI	New Plant	New Construction Permit	
10	350	East	ADA-ES	Bituminous	ESP	ACI	Retrofit	Consent Decree	
11	350	East	ADA-ES	Bituminous	ESP	ACI	Retrofit	Consent Decree	
12	204	Midwest	Dustex	PRB	TOXECON	ACI	Retrofit	Consent Decree	
13	375	East	Siemens Envir. Sys.	Bituminous		ACI	Retrofit	Consent Decree	1 st Qtr 2008
14	650	Midwest	Alstom (ADA-ES)	PRB	SDA/FF	ACI	New Plant	New Construction Permit	
15	156 MW ea. 315 Total	Midwest	Powerspan	Bituminous	Multi-pollutant	ECO	Retrofit	Construction Permit	
16	750	Midwest	Siemens Envir. Sys.	High Sul. Bit	ESP/WFGD/WES P	ACI	New Plant	Construction Permit	3 rd Qtr 2009
17	680	South	Alstom (ADA-ES)	PRB	SDA/FF	ACI	New Plant	Construction Permit	

	Plant Size (MW)	Location	Prime OEM Contractor	Coal	APC Configuration	Hg Control	New Plant or Retrofit	Regulatory Driver	Anticipated Startup Date
18	107	East	BPI	Bit./Bio-Mass	FT- SNCR/CDS/FF	ACI	Retrofit	DOE Demo.	
19	860	South	BPI	Lignite	SCR/FF/WFGD	ACI	New Plant	Construction Permit	
20	860	South	BPI	Lignite	SCR/FF/WFGD	ACI	New Plant	Construction Permit	
21	220	West	B&W (ADA-ES)	PRB	SDA/FF	ACI	New	Construction Permit	
22	575	Southwest	B&W (STC)	West.Bit/Sub. Bit. Blend	HS- ESP/FF/WFGD	ACI	Retrofit	Construction Permit	
23	575	Southwest	B&W (STC)	West.Bit/Sub. Bit. Blend	HS- ESP/FF/WFGD	ACI	Retrofit	Construction Permit	
24	335	Northeast	ADA-ES	Bituminous	Cold-Side ESP	ACI	Retrofit	Voluntary Regional Emission Abatement Plan	
25	880	South	Siemens Envir. Sys.	PRB	ESP/FF (TOXECON)	ACI	Retrofit	Voluntary Regional Emission Abatement Plan	4 th Qtr 2008
26	350	Midwest	Hamon (ADA-ES)	PRB	SCR/FF	ACI	Retrofit	State Regulatory	
27	650	Southwest	ADA-ES	PRB	ESP/FF	ACI	Retrofit	Voluntary Regional Emission Abatement Plan	
28	628	Southwest	ADA-ES	PRB	ESP/FF Parallel Flow	ACI	Retrofit	Voluntary Regional Emission Abatement Plan	
29	855	Southwest	ADA-ES	Lignite/PRB	ESP/WFGD	ACI	Retrofit	Voluntary Regional Emission Abatement Plan	
30	670	Midwest	Alstom/ADA-ES	PRB	SCR/FF/WFGD	ACI	Retrofit	Construction Permit of new unit	
31	850	Midwest	Alstom/ADA-ES	PRB	SCR/FF/WFGD	ACI	New	Construction Permit	
32	167	East	Sorbent Technologies	E- Bitum	ESP/WFGD	ACI	Retrofit	Consent Decree	
33	108	Midwest	Dustex	PRB	TOXECON	ACI	Retrofit	Consent Decree	
34	159	Midwest	NORIT	PRB	ESP	ACI	Retrofit	CAMR	1 st Qtr 2010
35	348	Midwest	NORIT	PRB	ESP	ACI	Retrofit	State Regulatory	

	Plant Size (MW)	Location	Prime OEM Contractor	Coal	APC Configuration	Hg Control	New Plant or Retrofit	Regulatory Driver	Anticipated Startup Date
36	237	Midwest	NORIT	PRB	ESP	ACI	Retrofit	State Regulatory	
37	347	Midwest	NORIT	PRB	ESP	ACI	Retrofit	State Regulatory	
38	341	Midwest	NORIT	PRB	ESP	ACI	Retrofit	State Regulatory	
39	566	Midwest	NORIT	PRB	ESP	ACI	Retrofit	State Regulatory	
40	561	Midwest	NORIT	PRB	ESP	ACI	Retrofit	State Regulatory	
41	850	Midwest	NORIT	PRB	ESP	ACI	Retrofit	State Regulatory	
42	850	Midwest	NORIT	PRB	ESP	ACI	Retrofit	State Regulatory	
43	359	Midwest	NORIT	PRB	ESP	ACI	Retrofit	State Regulatory	
44	385	Midwest	NORIT	PRB	ESP	ACI	Retrofit	State Regulatory	
45	281	Midwest	NORIT	PRB	ESP	ACI	Retrofit	State Regulatory	
46	551	Midwest	NORIT	PRB	ESP	ACI	Retrofit	State Regulatory	
47	400	Southwest	Alstom/ADA-ES	PRB	SDA/FF	ACI	New	Construction Permit	
48	495	Alberta Canada	B&W/NORIT	Can. Sub-Bit.	SDA/FF	ACI	New	Construction Permit	
49	800	Midwest	Siemens Envir. Sys.	E. Bit	Lime Inj./ESP/WFGD/WESP	ACI	New	Construction Permit	2 nd Qtr 2010
50	800	Midwest	Siemens Envir. Sys.	E. Bit	Lime Inj./ESP/WFGD/WESP	ACI	New	Construction Permit	2 nd Qtr 2011
51	350	Midwest	ADA-ES	PRB	ESP	ACI	Retrofit	Construction Permit	
52	568	Southwest	AESI/ADA-ES	Lignite	CFB Boilers/SNCR/A CI/CDS-DFGD/FF	ACI	New	Construction Permit	
53	248	Midwest	ADA-ES	PRB	ESP	ACI	Retrofit	State Regulatory	
54	590	Midwest	ADA-ES	PRB	ESP	ACI	Retrofit	State Regulatory	

	Plant Size (MW)	Location	Prime OEM Contractor	Coal	APC Configuration	Hg Control	New Plant or Retrofit	Regulatory Driver	Anticipated Startup Date
55	608	Midwest	ADA-ES	PRB	ESP	ACI	Retrofit	State Regulatory	
56	110	Midwest	ADA-ES	PRB	ESP	ACI	Retrofit	State Regulatory	
57	272	Midwest	ADA-ES	PRB	ESP	ACI	Retrofit	State Regulatory	
58	375	Midwest	ADA-ES	PRB	ESP	ACI	Retrofit	State Regulatory	
59	100 ea. 200 Total	Northeast	Clyde Bergemann EEC	PRB	Dry Injection/FF	ACI	Retrofit	State Regulatory	
60	200 ea. 400 Total	Northeast	Clyde Bergemann EEC	PRB	Dry Injection/FF	ACI	Retrofit	State Regulatory	
61	200 ea. 400 Total	Northeast	Clyde Bergemann EEC	PRB	Dry Injection/FF	ACI	Retrofit	State Regulatory	
62	300	Midwest	Allied/ADA-ES	PRB	CDS/FF	ACI	Retrofit	Construction Permit	
63	200	Midwest	Siemens Envir. Sys.	III Bit	FF/WFGD/ WESP	Ca(OH) ₂ /ACI	Retrofit	State Regulatory	3 rd Qtr 2009
64	680	East	Siemens Envir. Sys.	INR Bit & Pet Coke	FF/WFGD	Ca(OH) ₂ /ACI	New	Construction Permit	4 th Qtr 2009
65	680	East	Siemens Envir. Sys.	INR Bit & Pet Coke	FF/WFGD	Ca(OH) ₂ /ACI	New	Construction Permit	1 st Qtr 2010
66	493	Midwest	Siemens Envir. Sys.	PRB	SDA/FF	ACI	Retrofit	State Regulatory	3 rd Qtr 2009
67	638	Midwest	Siemens Envir. Sys.	PRB	Initial ESP Later SDA/FF	ACI	Retrofit	State Regulatory	3 rd Qtr 2009
68	637	Midwest	Siemens Envir. Sys.	PRB	Initial ESP Later SDA/FF	ACI	Retrofit	State Regulatory	3 rd Qtr 2009
69	627	Midwest	Siemens Envir. Sys.	PRB	Initial ESP Later SDA/FF	ACI	Retrofit	State Regulatory	3 rd Qtr 2009
70	382	Midwest	Siemens Envir. Sys.	PRB	ESP	ACI	Retrofit	State Regulatory	3 rd Qtr 2009
71	880	South	Siemens Envir. Sys.	PRB	ESP/FF Toxecon	ACI	Retrofit	Voluntary Regional Emissions Abatement Plan	4 th Qtr 2009
72	880	South	Siemens Envir. Sys.	PRB	ESP/FF Toxecon	ACI	Retrofit	Voluntary Regional Emissions Abatement Plan	2 nd Qtr 2009
73	880	South	Siemens Envir. Sys.	PRB	ESP/FF Toxecon	ACI	Retrofit	Voluntary Regional Emissions Abatement Plan	1 st Qtr 2010
74	620	East	Alstom/ADA-ES	E. Bit &	ESP/DFGD/PJFF	ACI	Retrofit	State Regulatory	

	Plant Size (MW)	Location	Prime OEM Contractor	Coal	APC Configuration	Hg Control	New Plant or Retrofit	Regulatory Driver	Anticipated Startup Date
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75	52 MW 73 MW	West	ADA-ES	PRB	ESP	ACI (Combined Sys.)	Retrofit	CAMR Early Compliance	
76	860	Southwest	NORIT	Lignite	ESP	ACI	Retrofit	CAMR	1 st Qtr 2010
77	618	Southwest	NORIT	Sub. Bit.	ESP	ACI	Retrofit	CAMR	3 rd Qtr 2010
78	837	Southwest	NORIT	Lignite	ESP	ACI	Retrofit	CAMR	1 st Qtr 2010
79	620	East	NORIT	Bituminous	ESP	ACI	Retrofit	State Regulatory	1 st Qtr 2010
80	614	East	NORIT	Bituminous	ESP	ACI	Retrofit	State Regulatory	1 st Qtr 2010
81	348	Southwest	Sorbent Technologies	W. Bit/Sub. Bit Blend	HS- ESP/FF/WFGD	ACI	Retrofit	Construction Permit	
82	329	Southwest	Sorbent Technologies	W. Bit/Sub. Bit Blend	HS- ESP/FF/WFGD	ACI	Retrofit	Construction Permit	
83	220	West	Allied/ADA-ES	PRB	CFB/FF	ACI	New	Construction Permit	
84	860	Southwest	NORIT Americas, Inc.	Lignite	ESP (cold)	ACI	Retrofit	CAMR	
85	618	Southwest	NORIT Americas, Inc.	Subbituminous	ESP (cold)	ACI	Retrofit	CAMR	
86	183 ea. 366 Total	Midwest	NORIT Americas, Inc.	Subbituminous	ESP (cold)	ACI	Retrofit	State Regulatory	
87	183 ea. 366 Total	Midwest	NORIT Americas, Inc.	Subbituminous	ESP (cold)	ACI	Retrofit	State Regulatory	
88	183 ea. 366 Total	Midwest	NORIT Americas, Inc.	Subbituminous	ESP (cold)	ACI	Retrofit	State Regulatory	
89	305 ea. 610 Total	Canada	NORIT Americas, Inc.	Subbituminous	ESP (cold)	ACI	Retrofit	Provincial Regulatory	

Terminology:

- ESP – Electrostatic precipitators use electrical fields to remove pollutants such as particulates and mercury from boiler flue gases. The electric field drives particulates to the collecting electrodes where they are periodically dislodged using a mechanical process.
- Cold-Side ESP – Cold side electrostatic precipitators are ESPs located on the downstream side of the air preheater or heat exchanger (which transfers heat from the flue gas to the air to be fed into the furnace) and therefore operates at relatively low temperatures (i.e., temperatures of no more than about 200° C).
- HS-ESP – Hot side electrostatic precipitators are ESPs located on the upstream side of the air preheater and therefore operate at relatively high temperatures (i.e., more than about 250° C).
- WESP – Wet electrostatic precipitators use electric fields to remove pollutants such as particulates and mercury from boiler flue gases. The electric field drives particulates to the collecting electrodes which are periodically washed off with a liquid.
- ACI – Activated carbon injection is a form of sorbent injection technology that injects powdered activated carbon into the flue gas where it mixes with the gas to contact the sorbent. The sorbent is then collected in the particulate control device where there is a second opportunity for sorbent to contact the mercury in the flue gas.
- FF – Fabric filter, commonly referred to as a baghouse, is a particulate control device that also captures mercury. Fabric filter collectors pass the flue gas through a tightly woven fabric where the particulates in the flue gas will be collected on the fabric by sieving and other mechanisms. The dust cake which forms on the filter is periodically removed from the fabric and collected in a hopper.
- TOXECON – TOXECON is an EPRI patented technology in which sorbents, including activated carbon is injected into a pulse-jet baghouse installed downstream of the existing particulate control device.
- WFGD – Wet flue gas desulfurization or wet scrubber is control system designed to remove SO₂ from flue gases and can also capture mercury. In a wet scrubber, a liquid sorbent is sprayed into the flue gas in an absorber vessel. The pollutant comes into direct contact with the sorbent and forms a wet slurry waste that is separated from the process stream.
- DFGD – Dry flue gas desulfurization or dry scrubber injects an alkaline sorbent into the flue gas to remove SO₂ and particulates but can also capture mercury. Dry flue gas desulfurization produces a dry solid by-product as the flue gas leaving the absorber is not saturated like in a WFGD.
- SDA – Spray dryer absorber is a form of dry flue gas desulfurization system.
- SCR – Selective catalytic reduction is a NO_x control device that can oxidize mercury. The basic principle of SCR is the reduction of NO_x to N₂ and H₂O by the reaction of NO_x and ammonia (NH₃) within a catalyst bed.
- SNCR – Selective non-catalytic reduction is a NO_x control device that utilizes a chemical process where a reducing agent, typically ammonia or urea, is injected into the process gases to convert nitrogen oxides into molecular nitrogen.
- CFB – Circulating fluidized bed is a combustion process where crushed coal is mixed with limestone and fired in a process resembling a boiling fluid.
- APC Configuration – Air pollution control configuration refers to the emissions control technologies that are currently on the boiler or that contribute to mercury control.